

## **REMARKS / ARGUMENTS**

### **Status of Claims**

Claims 1, 2, 5-13, 17, 18, 21-29 and 32-36 are pending and stand rejected in the application. Claims 33-36 are objected to. Of the pending claims, Applicant has amended Claims 1, 17, 32, 33 and 35, leaving Claims 1, 2, 5-13, 17, 18, 21-29 and 32-36 for consideration upon entry of the present Amendment.

Applicant respectfully submits that the rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) have been traversed, that no new matter has been entered, and that the application is in condition for allowance.

### **Status of Drawings**

The drawings filed on February 23, 2004, are accepted by the Examiner.

### **Objections to the Claims**

The Examiner objected to Claims 33-36, requesting that “determines” be replaced by --determine-- after “adapted to:”.

Applicant has amended Claims 33-36 as suggested.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of this objection.

### **Rejections Under 35 U.S.C. §102(b)**

Claims 1, 2, 5-12 and 32-36 stand rejected under 35 U.S.C. §102(b) as being anticipated by Gono et al. (U.S. Patent No. 5,873,826, hereinafter Gono). The Examiner comments that Gono discloses the elements of the subject claims. Applicant traverses this rejection for the following reasons.

Applicant respectfully submits that “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, *in a single prior art reference.*” *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d

628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). Moreover, “[t]he identical invention must be shown in as complete detail as is contained in the \*\*\* claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Furthermore, the single source must disclose all of the claimed elements “arranged as in the claim.” Structural Rubber Prods. Co. v. Park Rubber Co., 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984). Missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference. Titanium Metals Corp. v. Banner, 778 F.2d 775, 780, 227 U.S.P.Q. 773, 777 (Fed. Cir. 1985).

Applicant has amended independent Claim 1 to now recite, *inter alia*:

“...operating the imaging system so as to cause the imaging system to emit radiation having a radiation intensity and an angular radiation distribution comprising a first angular radiation distribution suitable for a 360 degree image reconstruction and a second angular radiation distribution suitable for a 180 degree image reconstruction, said first angular radiation distribution having a first average radiation distribution, said second angular radiation distribution having a second average radiation distribution, *said first and second angular radiation distributions varying in intensity throughout the scan, and said first and second average radiation distributions being about constant throughout said scan...*” (emphasis added), which finds support in the specification as originally filed at paragraphs [0030-0032] and Figures 4B and 5.

Applicant has also amended independent Claims 32, 33 and 35, to include language similar to the amended language of Claim 1. Dependent claims inherit all of the limitations of the parent claim.

With the present amendment, Applicant claims a method and structure for reducing radiation exposure at an entry location that includes operating the imaging system so as to cause the imaging system to emit radiation having a radiation intensity and an angular radiation distribution comprising a first angular radiation distribution suitable for a 360 degree image reconstruction and a second angular radiation distribution suitable for a 180 degree image reconstruction, said first angular radiation distribution

having a first average radiation distribution, said second angular radiation distribution having a second average radiation distribution, *said first and second angular radiation distributions varying in intensity throughout the scan, and said first and second average radiation distributions being about constant throughout said scan.* Claim support may be found at Paragraph [0032] and Figures 4B and 5.

Specifically at Figure 4B, Applicant illustrates *an angular radiation distribution 46 that varies* in intensity *throughout the scan* in a plus-and-minus fashion with respect to the *average radiation distribution 44*, which itself stays *about constant throughout the scan*.

Applicant submits that while Gono may disclose a fluoroscopy method and x-ray CT apparatus capable of half-scan (180 degree) reconstruction and full-scan (360 degree) reconstruction, and being capable of an ON/OFF current setting or a trigonometric current function (Title, and col. 5, line 31, through col. 6, line 15), Gono fails to disclose all elements of the invention as claimed. More specifically, Applicant submits that Gono fails to disclose *first and second angular radiation distributions varying in intensity throughout the scan, and the first and second average radiation distributions being about constant throughout said scan*, as claimed in the instant invention.

The Examiner alleges that Gono teaches the first and second average radiation distributions being about constant throughout the scan, alleging that since an average is just a constant, the first and second average radiation distributions could be said to be constant throughout the scan. Paper 05032004, page 7.

While the Examiner speculates that an average is a constant and therefore *could be* a constant *throughout* the scan, the Examiner has not shown with specificity where in Gono the elements of said first and second angular radiation distributions are disclosed as *varying in intensity throughout the scan*, and where said first and second average radiation distributions are disclosed as *being constant throughout* the scan, as claimed in the instant invention.

Furthermore, Applicant respectfully submits that where an average radiation distribution may be viewed as a constant as asserted by the Examiner, it does not

necessarily follow, without a specific showing to the contrary, that the average radiation distribution is a constant *throughout* the scan. An average distribution being a constant at one point in a scan does not necessarily result in the average distribution being a constant *throughout* the scan, and the Examiner has not shown with specificity where in Gono such elements of the invention may be found.

For example, and as illustrated in Figure 4B, Applicant depicts an angular radiation distribution 46 having an intensity less than the average radiation distribution 44, as shown at the entry location 40, and an angular radiation distribution 46 having an intensity greater than the average radiation distribution 44, as shown at the location opposite the entry location 40, thereby showing an angular radiation distribution 46 that varies in intensity throughout the scan, while the average radiation distribution 44 stays about constant throughout the scan. Accordingly, Applicant's imaging system may be operated so as to cause an angular radiation distribution 46 to vary plus-minus with respect to the average radiation distribution 44, causing *the angular radiation distribution to vary in intensity throughout the scan, while the average radiation distribution is about constant throughout said scan.*

In comparing the instant invention to Gono, Applicant finds Gono to be absent any disclosure of an average radiation distribution being constant *throughout* the scan *while allowing* the angular radiation distribution to vary in intensity *throughout* the scan. Accordingly, Gono is absent each and every element of the claimed invention, and discloses a substantially different invention to the claimed invention, and therefore cannot be anticipatory.

Additionally, the Examiner asserts that Applicant's use of "adapted to" language that suggests or makes optional but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim limitation. MPEP §2106. Paper 05032004, page 6.

Applicant has amended independent Claims 1, 32, 33 and 35, to replace the "adapted to" language with alternative language that better describes the claimed subject

matter that Applicant regards as the invention. In so doing, Applicant respectfully submits that the present amendment sets forth additional method steps to be performed in a method claim by requiring that the method perform additional operations, and sets forth additional structure in an apparatus claim.

In view of the amendment and foregoing remarks, Applicant submits that Gono does not disclose each and every element of the claimed invention and therefore cannot be anticipatory. Accordingly, Applicant respectfully submits that the Examiner's rejection under 35 U.S.C. §102(b) has been traversed, and requests that the Examiner reconsider and withdraw of this rejection.

#### **Rejections Under 35 U.S.C. §103(a)**

##### **Regarding Claims 17, 18 and 21-28**

Claims 17, 18 and 21-28, stand rejected under 35 U.S.C. §103(a) as being unpatentable over Gono in view of Zmora (U.S. Patent No. 6,028,909, hereinafter Zmora).

The Examiner acknowledges that Gono fails to teach a medium encoded with a machine-readable computer program code that implements the method of claims 1, 2, and 5-12, and looks to Zmora to cure this deficiency.

Applicant traverses the Examiner's rejections for the following reasons.

Applicant respectfully submits that the obviousness rejection based on the References is improper as the References fail to teach or suggest each and every element of the instant invention. For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). The Examiner must meet the burden of establishing that all elements of the invention are taught or suggested in the prior art. MPEP §2143.03.

While Zmora may disclose a method for CT imaging in the form of a computer readable medium (Abstract, and col. 8, lines 24-29), Applicant submits that Zmora as

referenced fails to cure the deficiencies of Gono with respect to the elements of Claims 17, 18, and 21-28.

In comparing Zmora with the claimed invention, Applicant submits that Zmora fails to teach, or suggest the element of "...operating the imaging system so as to cause the imaging system to emit radiation having a radiation intensity and an angular radiation distribution comprising a first angular radiation distribution suitable for a 360 degree image reconstruction and a second angular radiation distribution suitable for a 180 degree image reconstruction, said first angular radiation distribution having a first average radiation distribution, said second angular radiation distribution having a second average radiation distribution, *said first and second angular radiation distributions varying in intensity throughout the scan, and said first and second average radiation distributions being about constant throughout said scan...*", as claimed in independent Claim 17.

Dependent claims inherit all of the limitations of the parent claim.

In view of the foregoing, Applicant submits that the References fail to teach or suggest each and every element of the claimed invention and disclose a substantially different invention from the claimed invention, and therefore cannot properly be used to establish a *prima facie* case of obviousness. Accordingly, Applicant respectfully requests reconsideration and withdrawal of this rejection.

Regarding Claims 13 and 29

Claims 13 and 29 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Gono in view of Zmora as applied to Claims 12 and 28 above, and further in view of Popescu (U.S. Patent No. 5,822,393, hereinafter Popescu).

The Examiner acknowledges that Gono in combination with Zmora fails to teach controlling the imaging system so as to modulate the radiation intensity in a manner responsive to the radiation absorption angular profile, and looks to Popescu to cure this deficiency.

Applicant traverses the Examiner's rejections for the following reasons.

Applicant respectfully submits that the obviousness rejection based on the References is improper as the References fail to teach or suggest each and every element

of the instant invention. For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). The Examiner must meet the burden of establishing that all elements of the invention are taught or suggested in the prior art. MPEP §2143.03.

While Popescu may disclose a CT system and method that modulates the radiation intensity in a manner responsive to the radiation absorption angular profile (col. 6, lines 6-17), thereby keeping the minimum x-ray intensity above the noise level so that a noise-free image can be reconstructed (col. 5, lines 38-53), Applicant submits that Popescu as referenced fails to cure the deficiencies of Gono in combination with Zmora with respect to the elements of Claims 13 and 29. Dependent claims inherit all of the limitations of the respective parent claim.

In comparing Popescu with the claimed invention, Applicant submits that Popescu fails to teach, or suggest the element of "...operating the imaging system so as to cause the imaging system to emit radiation having a radiation intensity and an angular radiation distribution comprising a first angular radiation distribution suitable for a 360 degree image reconstruction and a second angular radiation distribution suitable for a 180 degree image reconstruction, said first angular radiation distribution having a first average radiation distribution, said second angular radiation distribution having a second average radiation distribution, ***said first and second angular radiation distributions varying in intensity throughout the scan, and said first and second average radiation distributions being about constant throughout said scan...***", as claimed in independent Claims 1 and 17. Dependent claims inherit all of the limitations of the respective parent claim.

In view of the foregoing, Applicant submits that the References fail to teach or suggest each and every element of the claimed invention and disclose a substantially different invention from the claimed invention, and therefore cannot properly be used to establish a *prima facie* case of obviousness. Accordingly, Applicant respectfully requests reconsideration and withdrawal of this rejection.

Regarding Claims 13, 17, 18 and 21-29, Alternatively

Furthermore, Applicant respectfully submits that the Examiner cannot establish obviousness by merely inquiring into the obviousness of the differences between the claimed invention and the prior art, but must inquire into the obviousness of the claimed invention as a whole. *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 221 USPQ 1025, 1033 (Fed. Cir. 1984). For an obviousness rejection to be proper, the rejection must be grounded on whether “there is something in the prior art as a **whole** to suggest the desirability, and thus the obviousness, of making **the combination**.” (Emphasis added). *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d at 1462, 221 USPQ at 488. It is not enough to merely inquire into the differences between the claimed invention and the prior art, it is the claimed invention as a whole that must be viewed in light of the prior art.

As discussed above, Applicant claims, inter alia, “*...said first and second angular radiation distributions varying in intensity throughout the scan, and said first and second average radiation distributions being about constant throughout said scan...*”.

At paragraph [0032], Applicant discusses that by allowing for a nearly constant average radiation distribution 44 throughout the scan while allowing for the angular radiation distribution 46 to be modified, the noise level of the image may be compensated for by amplification of the emitter tube current *at the opposing angle* (180 degrees for 360 degree reconstruction), or *at the perpendicular angles* (+/- 90 degrees for 180 degree reconstruction), while dramatically reducing the physician’s hand to radiation exposure.

In comparison, the References are notably absent any discussion regarding the problems addressed by the instant invention or the claimed solution thereof, and when considered as a whole are absent any suggestion or desirability, and thus obviousness, of making **the combination**, in the manner disclosed and claimed in the instant application.

In view of the foregoing, Applicant submits that the References do not establish a *prima facie* case of obviousness for the claimed invention as a whole, and therefore

cannot properly be used for that purpose. Accordingly, Applicant respectfully requests reconsideration and withdrawal of this rejection.

In light of the forgoing, Applicant respectfully submits that the Examiner's rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) have been traversed, and respectfully request that the Examiner reconsider and withdraw these rejections.

The Commissioner is hereby authorized to charge any additional fees that may be required for this amendment, or credit any overpayment, to Deposit Account No. 07-0845.

In the event that an extension of time is required, or may be required in addition to that requested in a petition for extension of time, the Commissioner is requested to grant a petition for that extension of time that is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to the above identified Deposit Account.

Respectfully submitted,

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